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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,843	08/30/2001	Tomio Iwasaki	16869S-033100US	2145

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TOWNSEND AND TOWNSEND AND CREW, LLP  
TWO EMBARCADERO CENTER  
EIGHTH FLOOR  
SAN FRANCISCO, CA 94111-3834

EXAMINER

FOURSON III, GEORGE R

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicant(s)

09/943,843

Applicant(s)

IWASAKI ET AL.

Examiner

George Fourson

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 14 and 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2823

Applicant's election without traverse of the invention of claims 1-13 in Paper No. 5 is acknowledged.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 5, and all other occurrences in claims 1-13, it is unclear what is recited through use of "primary constituent material". The word "primary" has connotations related to value or importance and none related to relative proportions in a composition. In claims 2, 5 and 9, it is unclear whether the thickness range recited is the sum of the two thickness or the total thickness of the two layers.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al.

Hobbs et al suggests on a semiconductor substrate a 5-20 nm titanium dioxide gate dielectric 62 and the combination of 1) Ru or Ir and 2) iridium oxide or ruthenium oxide as 5-25 nm gate electrode material 64 (col.5). The reference does not disclose the metal film in contact with the gate dielectric.

Art Unit: 2823

However, in view of the stated suitability of the disclosed materials as gate electrodes it would have been within the scope of one of ordinary skill in the art to omit formation of further layers to achieve that function.

4-7

Claims 3,6,12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al as applied to claims 1,2,4,5 and 7 above, and further in view of Tsunashima et al.

Hobbs et al fails to disclose inclusion of crystallized titanium dioxide or titanium silicate in the gate dielectric. Tsunashima et al suggests use of titanium oxide on titanium silicate gate dielectric [0160]-[0161], for example. The use of crystallized titanium oxide is disclosed [0089].

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hobbs et al and Tsunashima et al to enable formation of the gate dielectrice of Hobbs et al.

4-7

Claims 8,9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al in as applied to claims 1,2,4,5 and 7 above, and further in view of Gilbert et al.

Hobbs et al fails to disclose incorporation of a ferroelectric capacitor in a circuit structure. Gilbert et al discloses integration of field effect transistors and ferroelectric capacitors to form a FeRAM. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Hobbs et al and Tsunashima et al with the teachings of Gilbert et al to enable formation of the FeRAM of Gilbert et al.

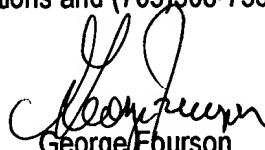
Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hobbs et al and <sup>Gilbert et al</sup> Tsunashima et al as applied to claims <sup>8,9+11</sup> 3,6,12 and 13 above, and further in view of Tsunashima et al.

Tsunashima et al is applied as above as suggesting crystallization of the titanium dioxide film of the combination.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner George Fourson whose telephone number is (703) 308-2544. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794. The fax number for this group is (703)308-7722 (or extensions 7724, 3431 or 3432) for regular communications and (703)308-7382 for after final communications.

  
George Fourson  
Primary Examiner  
Art Unit 2823

GFourson  
March 22, 2003